

(a) Delta Co's Hedging Decision

i. Money Market Hedge vs. Forward Market Hedge for Delta Co

Delta Co expects to receive €900,000 in six months and needs to evaluate whether a **money market hedge** or a **forward market hedge** would be more financially advantageous.

1. Money Market Hedge

1. **Amount in euros to borrow now:** Delta Co needs €900,000 in 6 months.

- **Interest rate on euros** = 2% per year.
- **6-month interest rate on euros** = $2\% \times \frac{1}{2} = 1\%$.

Formula to calculate the amount to borrow:

$$\text{Amount to borrow in euros} = \frac{900,000}{1 + 0.01} = \frac{900,000}{1.01} \approx 891,089 \text{ EUR}$$

2. **Convert euros to USD at the current spot rate:**

- **Spot rate** = €2.345 per \$1.

Formula to convert euros to USD:

$$\text{Amount in USD} = \frac{891,089}{2.345} \approx 379,292 \text{ USD}$$

So, Delta Co would borrow **\$379,292** in USD and convert it to euros.

3. **Repay USD loan in 6 months:**

- **USD borrow rate** = 3% per year.
- **6-month interest rate on USD** = $3\% \times \frac{1}{2} = 1.5\%$.

Formula to calculate USD repayment:

$$\text{Repayment in USD} = 379,292 \times (1 + 0.015) = 379,292 \times 1.015 = 384,529 \text{ USD}$$

So, Delta Co will need to repay **\$384,529** in 6 months.

2. Forward Market Hedge

1. **Convert €900,000 into USD at the forward rate:**

- **Forward rate** = €2.410 per \$1.

Formula to convert euros to USD:

$$\text{Amount in USD} = \frac{900,000}{2.410} \approx 373,870 \text{ USD}$$

So, Delta Co would receive **\$373,870** in 6 months.

Comparison:

- **Money Market Hedge:** Delta Co will repay **\$384,529** in 6 months.

- **Forward Market Hedge:** Delta Co will receive **\$373,870** in 6 months.

Conclusion: The **money market hedge** results in a higher USD amount (due to lower repayment compared to the forward market hedge). Therefore, **the money market hedge** is financially preferred by Delta Co.

ii. Alternative Hedging Techniques for Delta Co

Other than the **money market hedge** and **forward market hedge**, Delta Co has a few other hedging techniques available:

1. **Options Hedge:** Delta Co could purchase a **foreign exchange option** (put or call) to hedge against unfavorable exchange rate movements. This gives the right, but not the obligation, to exchange currency at a pre-agreed rate, providing flexibility.
 - **Advantages:** Flexible, no obligation to exercise the option.
 - **Disadvantages:** Cost of option premiums can be high.
 2. **Currency Swap:** Delta Co could enter into a currency swap agreement to exchange a stream of payments in euros for a stream of payments in USD. This could provide a predictable hedge if payments are made over time.
 - **Advantages:** Longer-term, stable cash flows.
 - **Disadvantages:** Complexity and administrative costs.
 3. **Natural Hedging:** If Delta Co has costs or liabilities in euros (e.g., sourcing supplies from EU), it can offset the incoming euro payments by the euro expenses. This reduces the need for a financial hedge.
 - **Advantages:** No additional cost.
 - **Disadvantages:** Dependent on operational activities and not always feasible.
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(b) Omega Co's Currency Transaction

i. Gain/Loss from Forward Exchange Contract for Omega Co

Omega Co expects to receive **€1,200,000** in 6 months, and the current exchange rate is **4.1720 - 4.2020 euros per \$**. The six-month forward rate is **4.1300 - 4.1600 euros per \$**.

To calculate the **loss or gain** compared to the current value, we use the **forward exchange rate** and compare it to the **spot rate**.

- **Current spot rate** = 4.1720 (buy) to 4.2020 (sell).
- **Forward rate** = 4.1300 (buy) to 4.1600 (sell).

Omega Co will receive euros, so it will be selling euros at the **buy side of the rates**.

- **Current value in dollars:**

$$\text{Current USD value} = \frac{1,200,000}{4.1720} = 287,176 \text{ USD}$$

- **Forward value in dollars:**

$$\text{Forward USD value} = \frac{1,200,000}{4.1600} = 288,462 \text{ USD}$$

Gain from forward contract:

$$\text{Gain} = 288,462 - 287,176 = 1,286 \text{ USD}$$

Conclusion: Omega Co will make a **gain of \$1,286** by using the forward contract, as the forward rate is better than the spot rate.

Why take out a forward exchange contract?

- **Certainty:** Omega Co can lock in a rate and avoid the risk of adverse currency fluctuations.
 - **Hedge against volatility:** Given the unpredictable nature of exchange rates, a forward contract ensures a fixed exchange rate in 6 months.
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ii. International Fisher Effect and Exchange Rates

The **International Fisher Effect (IFE)** explains that the difference in nominal interest rates between two countries will influence the expected future exchange rate. The country with the higher interest rate will likely see its currency depreciate relative to the country with the lower interest rate.

Formula for IFE:

$$\frac{E(S_1)}{S_0} = \frac{1 + i_{\text{domestic}}}{1 + i_{\text{foreign}}}$$

Where:

- $E(S_1)$ is the expected future spot rate.
- S_0 is the current spot rate.
- i_{domestic} and i_{foreign} are the interest rates of the domestic and foreign countries.

Impact of IFE on Omega Co's situation:

- If **US interest rates** are higher than **European interest rates**, the **euro** is expected to depreciate against the **USD** over time.
- This is reflected in the **forward exchange rate** (which is lower than the current spot rate), consistent with the IFE prediction.

Thus, the **forward rate** reflects the expected depreciation of the euro due to the difference in interest rates, as predicted by the IFE.